

CHAPTER FIVE






Understanding Ammunition

Ammunition

Rifle cartridges and shotgun shells have similar designs, share the same basic parts, and depend on the same physical and chemical reactions to work, but are used for different purposes.

Basic components of ammunition

The basic components of ammunition are the case, primer, powder, and projectile(s). Shotshells have an additional component called wad.

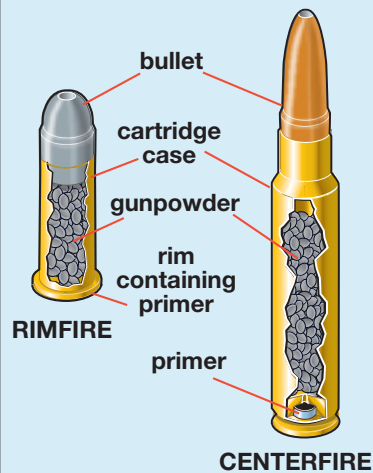
-  **Case:** The container that holds all the other ammunition components together. It's usually made of brass, steel, copper, paper, or plastic.
-  **Primer:** An explosive chemical compound that ignites the gunpowder when struck by a firing pin. Primer may be placed either in the rim of the case (rimfire) or in the center of the base of the case (centerfire).
-  **Gunpowder:** A chemical mixture that burns very rapidly and converts to an expanding gas when ignited. Modern smokeless powder will burn slowly when ignited in the open (outside of the case). Black powder is less stable and can be explosive when ignited in the open.
-  **Projectile:** The object(s) expelled from the barrel. A bullet is a lead projectile fired through a rifle or handgun barrel. A slug is a lead projectile fired through a shotgun barrel. Shot is a group of lead, steel, tungsten, or bismuth pellets fired through a shotgun barrel.
-  **Wad:** A seal made of paper or plastic separating the powder from the slug or shot in a shotshell. The wad prevents gas from escaping through the shot and holds the shot together as it passes through the barrel.

Learning Objectives

At the end of this chapter, you will be able to:

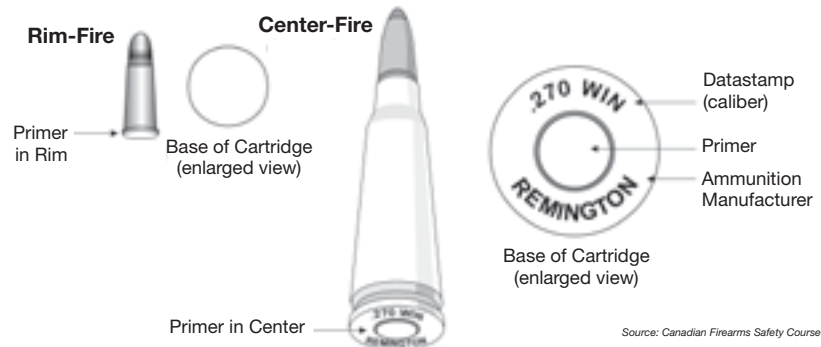
- Identify the basic components of rifle and shotgun ammunition.
- Correctly match ammunition with firearms.
- Explain the danger of mixing different gauges of shotshells.
- Choose the proper ammunition for the game you are hunting.
- Explain why it is important to know your firearm's range.

Rifle and Handgun Ammunition



Centerfire and rimfire ammunition

- Centerfire ammunition is used for rifles, shotguns, and handguns. In this type of ammunition, the primer is located in the center of the case base. Most centerfire ammunition is reloadable.
- Rimfire ammunition has the primer contained in the rim of the ammunition case. Rimfire ammunition is limited to low-pressure loads. Rimfire cartridges are not reloadable.



Source: Canadian Firearms Safety Course

Bullets

Bullets come in different shapes and sizes and are commonly made of lead and copper.

Bullet weight. In addition to the caliber of your ammunition, you must also decide on weight. The weight of a bullet is expressed in grains. Generally, the heavier the bullet the more power it delivers.

Modern bullets are designed for particular sizes of game animals. It is possible, for example, to choose a bullet weight that is too light for large game. If the weight is incorrect you may end up wounding the animal rather than killing it quickly.

Bullet trajectory. Changing the weight of your bullet changes its trajectory. Trajectory is the path a bullet takes during flight. Several factors affect this path: gravity, air resistance, speed and weight of the bullet. Gravity pulls the bullet down as it travels forward which results in a downward curved flight path. The air provides resistance that slows the flight of the bullet.

<div> <div> <div></div> <div>lead</div> </div> <div> <div></div> <div>copper</div> </div> </div> <div>RIFLE BULLETS</div> <div>Source: Canadian Firearms Safety Course</div>					
Round Nose	Hollow Point	Full Metal Jacket	Partition Bullet	Boat Tail	Spire Point

Of course, a bullet travels much too quickly for you to be able to actually see its trajectory. You can see an example of a trajectory though by simply throwing a ball in the air and watching it come down.

The trajectory of a bullet is slightly curved. So, if you sight in your firearm to hit a target at 200 yards, you will hit your target high at 100 yards and low at 300 yards.



Since the trajectory of a bullet depends in part on its weight, you must carefully consider your weight choice. For example, a .30-06 Springfield cartridge with a 180-grain bullet has a different flight pattern than the same cartridge with a 150-grain bullet. Once you make your selection, practice sighting in your rifle using that ammunition before you head into the field.

Shotgun shells

The shotshell is made up of five basic parts—one more than the rifle cartridge. Four parts of the shotshell are the same as the rifle cartridge—case, primer, powder and projectile (shot). But the shotshell has a fifth part: the wad. The job of the wad is to keep the shot charge separate from the powder.

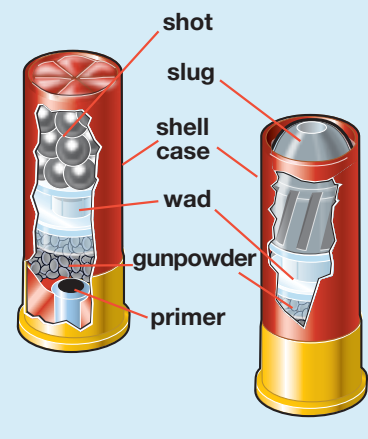
Each gauge of shotgun requires a specific shotshell. For example, a 12-gauge shotgun requires a 12-gauge shotshell, a 20-gauge shotgun requires a 20-gauge shotshell. Make sure the gauge of your shotgun matches the gauge marked on the shotshell. The gauge is also printed on the box in which shells come from the factory.

Shot size. Shot comes in various sizes. The sizes are numbered, but the larger the number, the smaller the size of the shot. So for example, No. 9 shot is very small while No. 000 shot is large. Choose the right shot size for the animals you are hunting. As a general rule, the smaller the game, the smaller the shot pellets need to be. Some big game species may be hunted using shot or slugs. Check Montana's hunting regulations before you choose your ammunition!

BEWARE: Ammunition can sometimes be put into the wrong box. Always look at the data stamp on the shell to make sure you are using the correct ammunition!

Load. You can buy the same gauge shotshells with various powder charges. The boxes may be marked target, field, or magnum load. Magnum loads have more powder and more shot than target or field

Shotgun Ammunition



Non-Toxic Shot

Non-toxic shot is required throughout the U.S. for waterfowl hunting. Studies showed that many waterfowl died each year because of lead poisoning. Lead pellets from traditional shotshells were picked up and digested by waterfowl. The toxic effect spread to other birds, such as the bald eagle, who consumed the poisoned waterfowl. To reduce this problem, conservationists worked with shotshell manufacturers to produce effective alternatives to lead shot—steel, tungsten, or bismuth shot.

loads. A 12-gauge 2¾-inch magnum shell, for example, will contain ¼ to ½ ounce more shot than a standard shell of the same size and gauge. Magnum shells are often longer than standard shells.

Length. The length of a shotshell is normally given in inches and is based on the length of the spent hull. Common lengths for 12-gauge shells are 2¾, 3 and 3½ inches. **Warning:** The new 3-inch and 3½-inch shells will not work in a shotgun made for 2¾-inch shells.

Shotgun choke and shot pattern

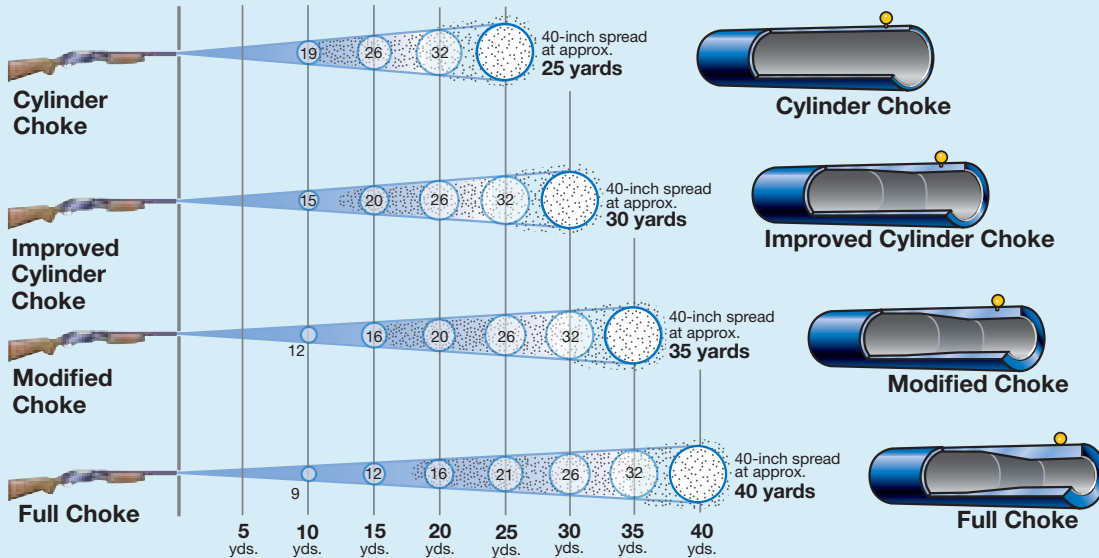
When a shotshell is fired from a shotgun, the pellets leave the barrel and begin to spread or scatter. The farther the pellets travel, the greater the spread of shot. Shotgun barrels have a choke to control the spread or shot pattern. Read more about how to pattern a shotgun on page 62.

- The choke of a shotgun acts like the nozzle of a garden hose. As the nozzle is tightened, water shoots out in a long, narrow stream, similar to the full choke on a shotgun. As the nozzle is opened, similar to the cylinder choke on a shotgun, water shoots out in a wider spray.
- Your distance from the target determines the choke you need. The choke does not alter the shotgun's power—it just controls how tight or spread out the shot pattern will be at a specific distance.
- The spread effect of the most common chokes is illustrated below. The choke controls how much shot will hit in a certain area at different ranges.
 - **Cylinder** choke is an unconstricted barrel. The shot pattern spreads quickly.
 - **Improved Cylinder** choke has a slight constriction. It allows the shot pattern to spread fairly quickly. This is a good choice for quail, rabbits, and other upland game.
 - **Modified** choke has moderate constriction. The shot stays together longer, making the pattern denser and more useful at longer ranges. This choke is used often for dove hunting and is the preferred choke when using steel shot to hunt for ducks or geese. There is also an Improved Modified choke that is slightly tighter than Modified.
 - **Full** choke has tight constriction. The shot holds together even longer, so it's good for squirrels, turkey, and other game shot at 35- to 40-yard ranges. Turkey hunters sometimes use Extra Full or Turkey choke for even denser patterns at long range.

Pattern Spread at Various Distances

Pattern spread of lead shot is shown below in inches.

Bore narrowing is exaggerated for clarity.



Shot Sizes

BUCK SHOT

Number	Diam. in inches
4	.24
3	.25
1	.30
0	.32
00	.33
000	.36

STEEL SHOT

Number	Diam. in inches	Approx. Pellets in 1 oz.
6	.11	317
4	.13	192
3	.14	154
2	.15	125
1	.16	103
BB	.18	72
BBB	.19	61
T	.20	53

LEAD SHOT

Number	Diam. in inches	Approx. Pellets in 1 oz.
12	.05	2385
9	.08	585
8	.09	410
7½	.09½	350
6	.11	225
5	.12	170
4	.13	135
2	.15	90
BB	.18	50

Shot size is adaptable to the game being hunted. As pellet diameter decreases, more shot can be placed in a standard shotshell

load. The smaller the shot number, the larger the shot size.

Steel Shot

Steel shot is slightly lighter than lead shot of the same size—reducing its velocity and distance (range). Also, steel shot is harder than lead, so the individual pellets stay round, keeping the pattern tighter. Some hunters use steel shot one or two sizes larger to make up for the difference in weight from lead shot. Others use the same size steel shot or even smaller steel shot to get more shot into their patterns. You should pattern your shotgun with various loads of steel shot before hunting waterfowl with it. Effective pattern density is the key. Maximum pellet counts spread evenly across a 30-inch circle are best. Full chokes generally produce poor patterns with steel shot.

The rear of a shotgun barrel should be marked with the gauge and the length of the chamber.



The data stamp of a rifle is usually stamped toward the rear of the barrel.

Choosing the right ammunition for your firearm

Only one size of ammunition properly fits any firearm. Putting any other size cartridge into a firearm is extremely dangerous. The best way to make sure you are putting the correct ammunition into your firearm is to match the data stamp on the barrel of your firearm to the similar data stamp on the case of the rifle cartridge or shotshell. Be particularly careful with hand-loaded ammunition as it could be mis-marked.

Caliber and gauge

Ammunition comes in different lengths, shapes, and diameters depending on the type of bullet or case used. You must choose a caliber or gauge that is suited to your firearm as well as the game you wish to hunt.

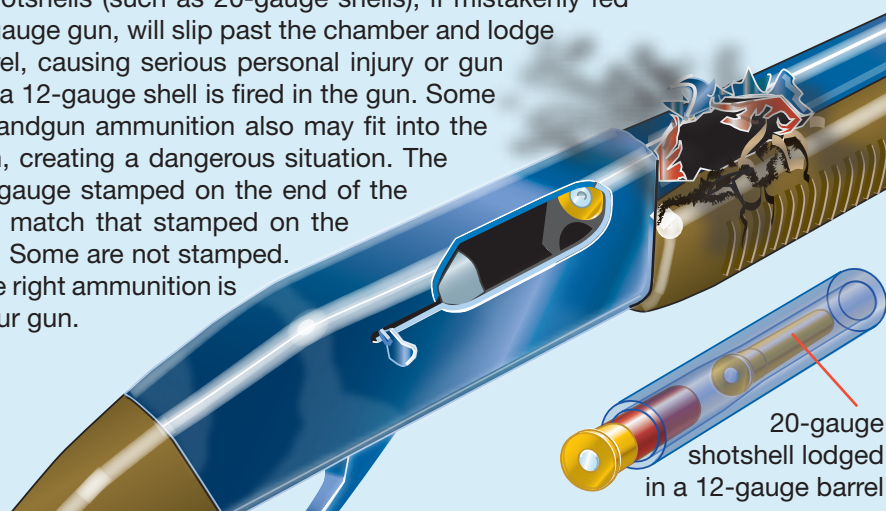
The data stamp

First, you must know the caliber or gauge of the firearm for which you are buying ammunition. To find that out, locate the data stamp on the barrel of your firearm. Does the data stamp on the ammunition match the data stamp on the barrel? If you are not sure always get help from a knowledgeable person. It is easy to be confused by all the different ammunition. Ask someone who is experienced and is familiar with your firearm to help you select the correct ammunition.

If you do not match the ammunition to the firearm, the cartridge could become lodged, explode, and cause serious injury to the user or a bystander. If the data stamp on the firearm does not match the data stamp on the ammunition, do not use the ammunition.

WARNING!

Smaller shotshells (such as 20-gauge shells), if mistakenly fed into a 12-gauge gun, will slip past the chamber and lodge in the barrel, causing serious personal injury or gun damage if a 12-gauge shell is fired in the gun. Some rifle and handgun ammunition also may fit into the wrong gun, creating a dangerous situation. The caliber or gauge stamped on the end of the shell must match that stamped on the gun barrel. Some are not stamped. Be sure the right ammunition is used in your gun.



Know your firearm's range

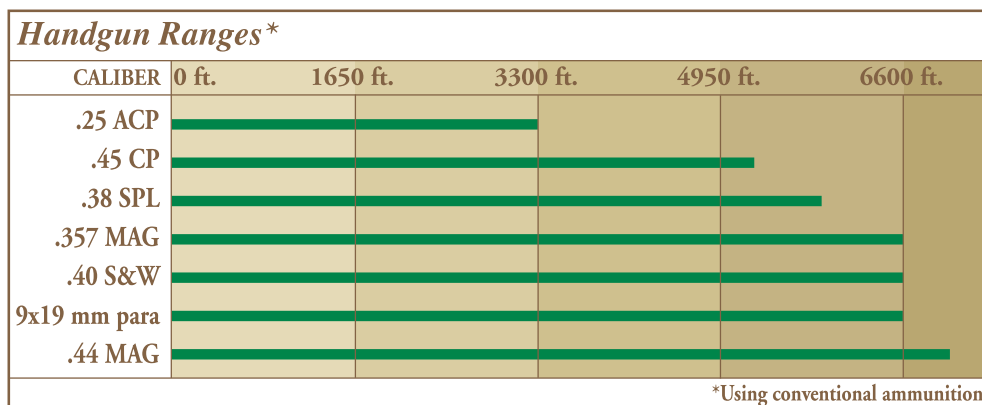
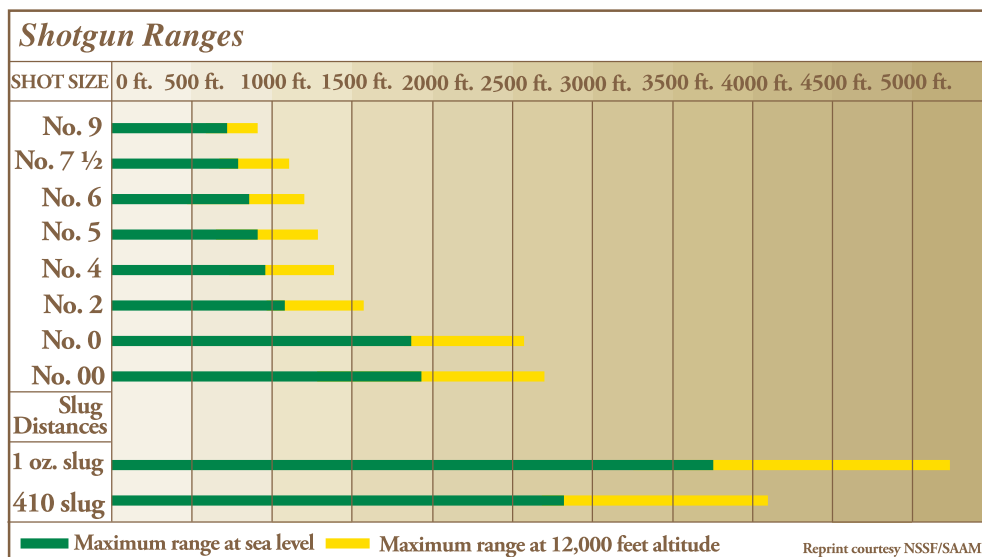
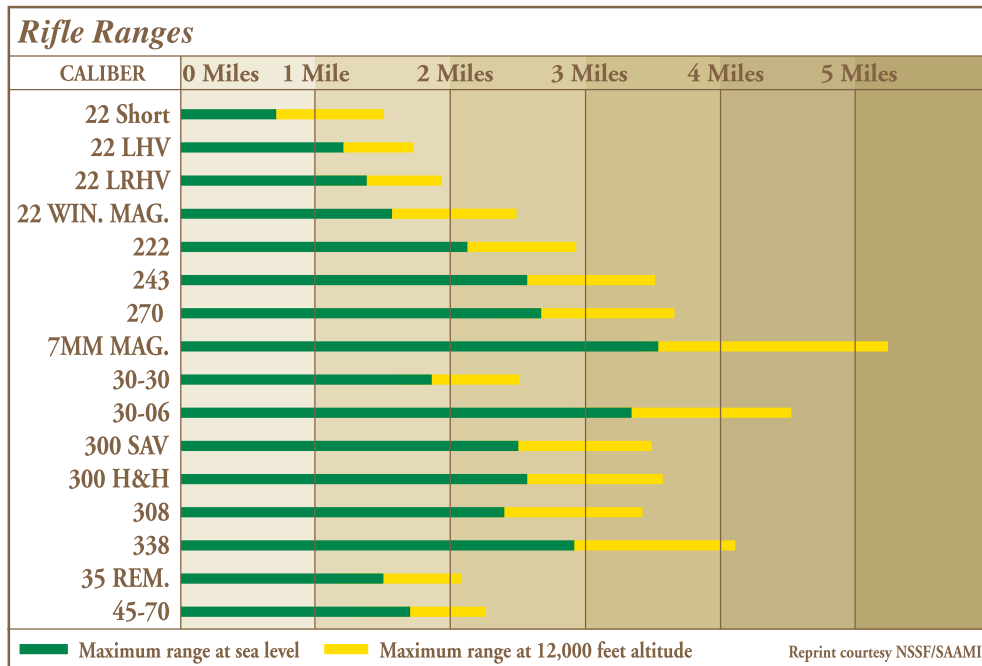
Knowing your firearm's range is critical to being a safe and responsible hunter. The range tells you at what distances your firearm's projectile could cause injury or damage to persons, animals, or objects. When hunting, knowing the range also lets you immediately assess when a shot will give a clean kill. Learning to estimate distances and knowing your firearm's range are important parts of hunting.

Game, Bullet Weight & Rifle Caliber

Description	Bullet Weight in Grains	Deer	Black Bear	Antelope	Bighorn Sheep	Mountain Goat	Moose	Elk	Fox	Coyote
.22 Rimfire	40									
.222 Rem	50								•	•
.22-250 Rem.	55								•	•
.243 Win.	75								•	•
	100	•	•	•						
.25-06 Rem.	120	•	•	•	•				•	•
.250 Savage	100	•	•	•					•	•
.270 Win.	130	•	•	•	•	•			•	•
	150	•	•		•	•	•			
7x57 mm Mauser.	139	•	•	•	•	•			•	•
	160	•	•		•	•	•			
7mm Rem. Mag.	175	•	•		•	•	•			
.30-.30 Win.	150	•	•						•	•
	170	•	•				•			
.30-06 Springfield	150	•	•	•	•	•			•	•
	180	•	•		•	•	•			
	220	•	•	•	•	•	•			
.300 Win. Magnum	180				•	•	•	•		
308 Win.	150	•	•	•	•	•			•	•
	180	•	•	•	•	•	•			

For general reference only





Chapter Five Quiz

1. To determine the appropriate gauge and length of the shell for a shotgun, look on the: (Mark the correct answer.)

_____ action
 _____ barrel
 _____ stock

2. Which of the following components is NOT found in a centerfire rifle cartridge? (Mark the correct answer.)

_____ case
 _____ powder
 _____ primer
 _____ wad

3. You have sighted in your hunting rifle using ammunition with a 150-grain bullet. You plan to go moose hunting and have purchased ammunition with a 180-grain bullet. Should you sight in your hunting rifle again? (Choose the correct answer.)

_____ yes
 _____ no

4. Different gauge shotshells should not be mixed together because _____.
 a. once mixed, it is impossible to separate them accurately.
 b. a smaller gauge shotshell can slip past the chamber of a larger gauge gun and result in serious personal injury.
 c. a 12-gauge shotshell can be chambered into a 20-gauge shotgun and result in serious personal injury.
 d. none of the above.

5. Label the indicated parts of rifle and shotgun ammunition:

